# RAILWAY TOPICS

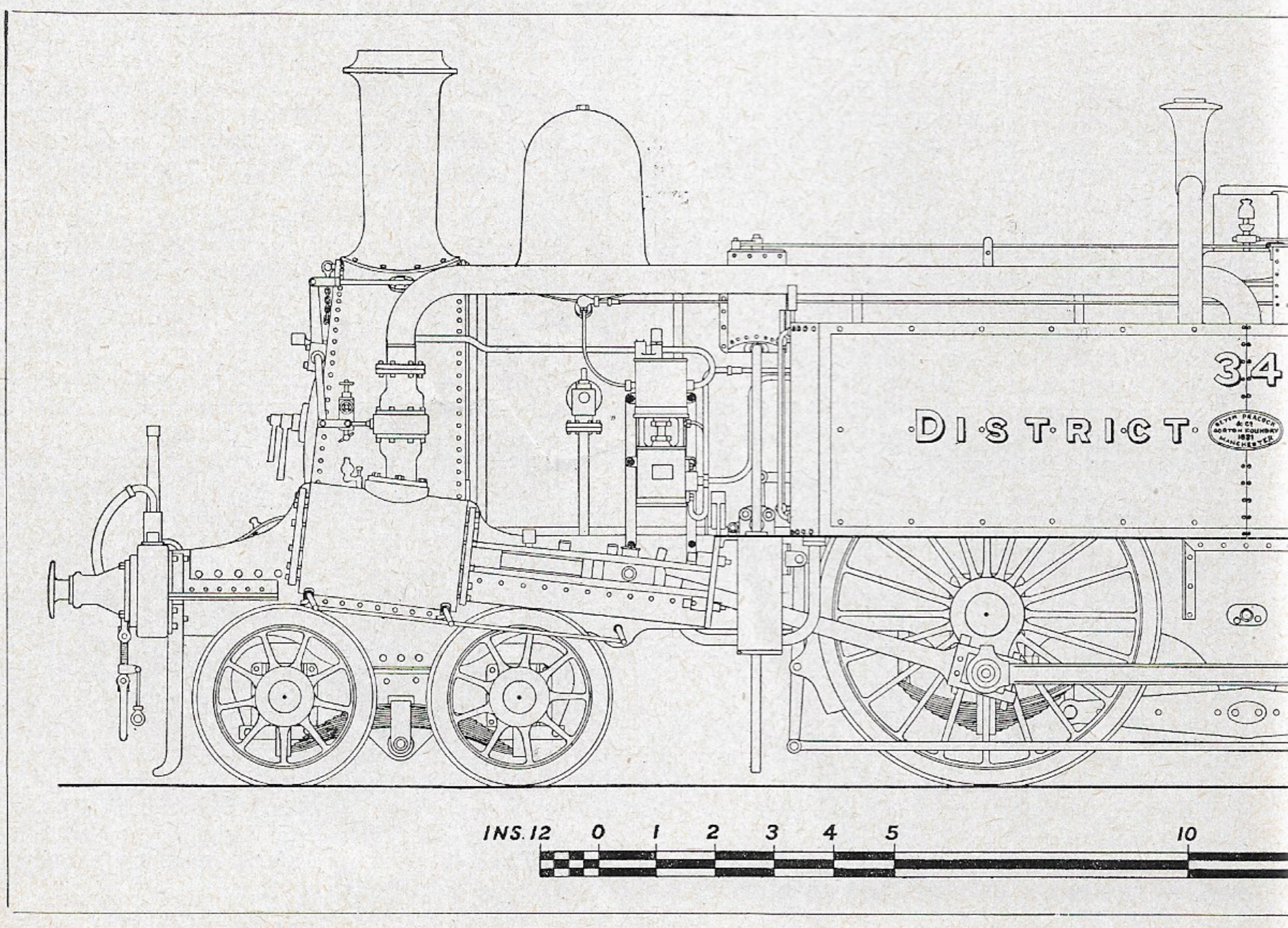
by J. N. Maskelyne, A.I.Loco.E.

FOR many years, I wanted to make a drawing of an old District Railway 4-4-0 tank engine ; but so many other things have claimed my time and attention that this particular drawing has not been completed until now. It was begun as long ago as September, 1938 !

Fifty years ago, when the only electric railways in London were the Central London and the City and South London " tubes," the intense traffic on the District Railway (or, to give it its full and proper title, the Metropolitan District Railway) was being efficiently handled by a class of fifty-four 4-4-0 type tank engines like No. 34. I knew and loved them all ; they fascinated me much more than the sixty-six engines of the same type which worked on the Metropolitan Railway, less than half of which were ever known to me. This is curious, in view of the fact that in those days I was more frequently travelling behind a Metropolitan engine. My trips on the District were few, by comparison, but I was often within sight of it and its engines, and within about three years, " collected " all its locomotive numbers, 1 to 54, into my notebook ! Since then, I have been trying to do the same with photographs of them ; but that seems hopeless, for my total, after more than thirty years of hunting, is six ! And two of those are of my own taking, because I was fortunate enough to be given permission to spend an afternoon at Lillie Bridge Depot, West Kensington, in 1923, when the last two survivors of the class, Nos. 33 and 34, were spending the declining days of their lives in doing light odd jobs. They were the only District locomotives that I ever caught with my camera ; and after I had finished with them separately, they were arranged buffer-to-buffer so that I could take a photograph of both together.

To outward appearances, all the fifty-four engines were alike, when I knew them ; but actually, there were slight differences which I will mention later, though a " small-toothed-comb " sort of scrutiny would have been required to detect them.

My drawing is based on a sectional elevation of one of the original Beyer, Peacock engines for the Metropolitan line, published in that wonderful book, *Railway Machinery*, by D. K. Clark and Zerah Colburn, about 1868. For external detail, I relied largely upon several photographs, including



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# District Railway 4-4-0 Tank Engines

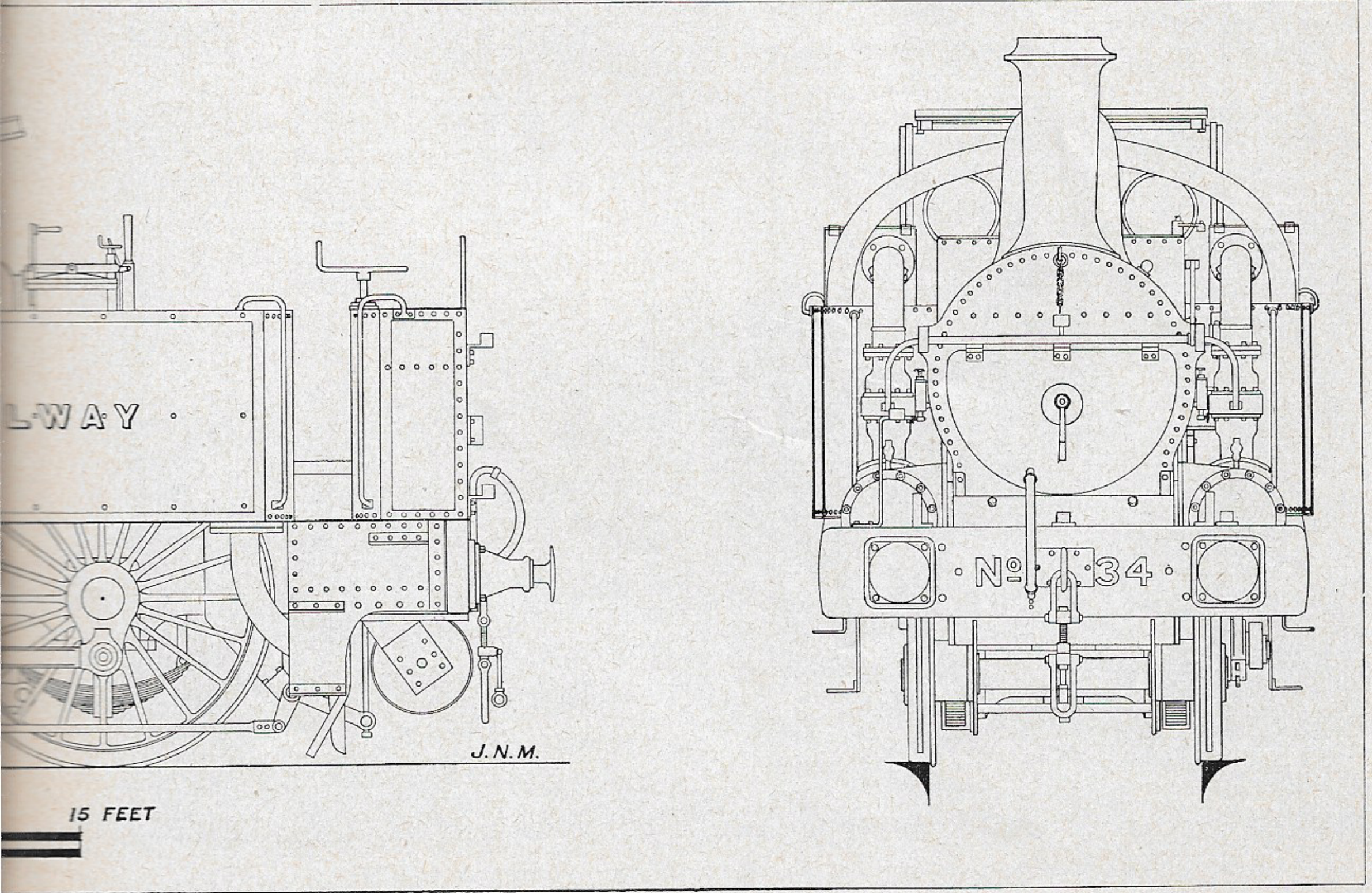
my own, of District engines ; and I fell into a trap from which I had a good deal of trouble to extricate myself. Working to the Clark and Colburn drawing, I found that the back end of the firebox protruded too far on to the footplate, judging by one of the photographs I was using. I checked all my dimensions very carefully against the Clark and Colburn drawing, but could find nothing wrong ; yet the back end of the firebox was obviously too far back. This was a puzzle that demanded the closest investigation.

In the *Locomotive Magazine* for January, 1906, I found a description of the District Railway locomotives, and there discovered something that I had not previously suspected or have ever seen specifically mentioned ; the fireboxes of the District engines were 5 ft. 7 in. long outside, whereas I believe that on all the other engines of this type, whether for the Metropolitan, the L.N.W.R., the Midland or the L.S.W.R., the firebox length was 6 ft. 7 in. ! I altered my drawing accordingly, and so got the back end of the firebox in its right place.

The District Railway engines were numbered consecutively from 1 to 54, after 1886. They were built in six separate batches, all by Beyer, Peacock & Co. Ltd., as follow : 1 to 24, works numbers 1063 to 1086, in 1871 (most of these were originally designated by letters, not numbers, in order to prevent confusion with the Metropolitan engines ); 25 to 30, works Nos. 1612 to 1617, in 1876 ; 31 to 36, works Nos. 2053 to 2058, in 1881 ; 37 to 42, works Nos. 2298 to 2303, in 1883 ; 43 to 48, works Nos. 2584 to 2589, in 1884, and 47 to 54, works Nos. 2776 to 2781, in 1886.

The principal dimensions of all these engines were : cylinders, 17 in. diameter by 24 in. stroke, inclined at an angle of 1 in 9 and with a transverse distance between the centre-lines of 6 ft. Flat valves, set vertically and driven by Allan's straight-link gear, controlled the steam distribution.

The boiler was 4 ft. diameter inside (4 ft. 4 in. outside the cleading) and 10 ft. 3 in. long ; there were 164 tubes of 2 in. diameter giving 903 sq. ft. of heating surface. The height of the centre-line above rail level was 6 ft. 7 in. The firebox was made of copper ; its length was 4 ft. 10½ in. at the top, tapering slightly to 5 ft. at the bottom, inside, and its width was 3 ft. 4½ in. at the centre-line ; the



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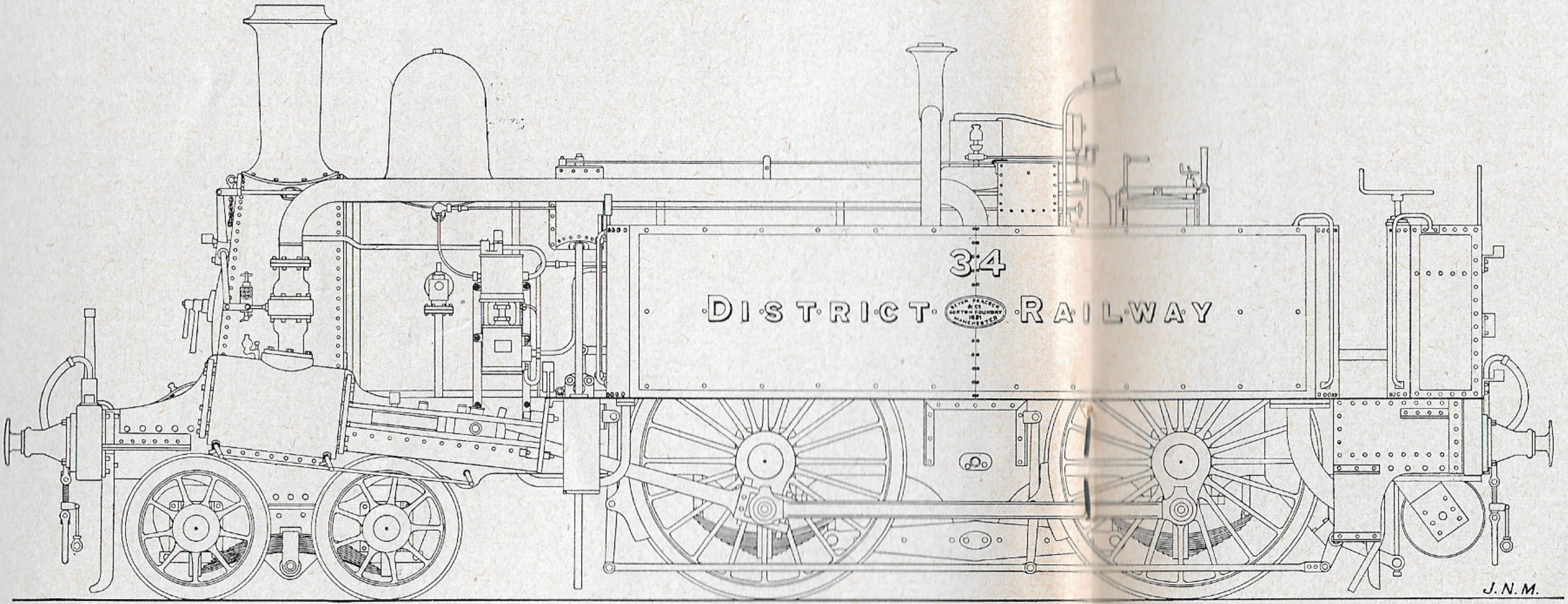


INS. 12 0 1 2 3 4 5 10 15 FEET



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outer casing was 5 ft. 7 in. long. The heating surface of the firebox was 90 sq. ft., so that the total heating surface was 993 sq. ft.

The working pressure was originally 160 lb. per sq. in., but this was afterwards reduced to 150 lb., and later still to 130 lb. The grate area was 16 sq. ft., and the weight of the engine in working order was 46 tons 10 cwt., of which 10 tons 17 cwt. rested on the bogie, 18 tons 1 cwt. on the driving-wheels and 17 tons 12 cwt. on the trailing wheels. The height from rail to the extreme top of the chimney was 12 ft. 6 in.

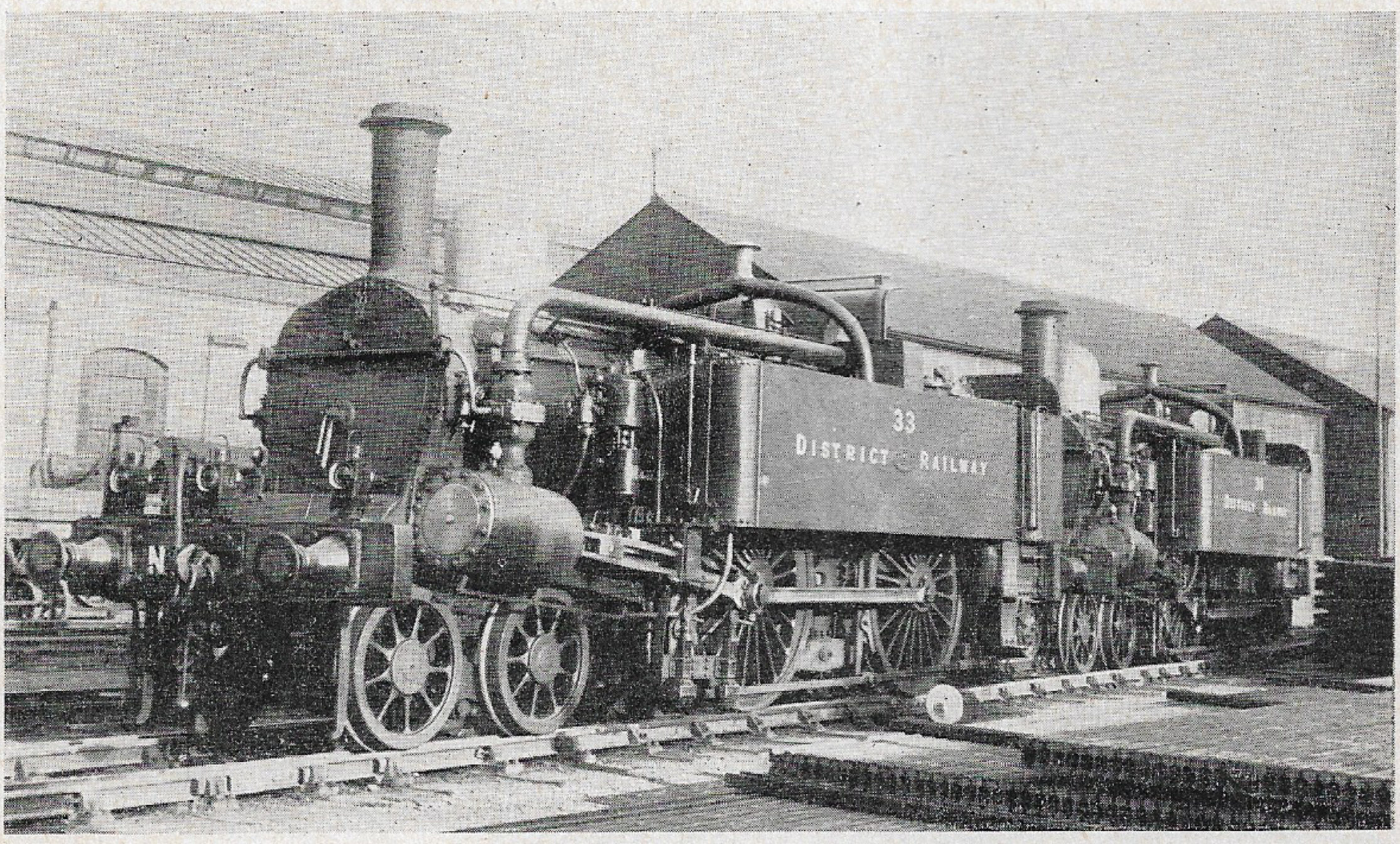
The bogie wheels were 3 ft. diameter and, be it noted, had only 9 spokes. The coupled wheels were 5 ft. 9½ in. diameter and had 20 spokes. The total wheelbase was 20 ft. 9 in. divided into 4 ft. plus 7 ft. 11 in. plus 8 ft. 10 in. The overhang at the leading end was 2 ft., and at the trailing end 6 ft., making the length of the main frames 28 ft. 9 in. The buffer-beams were of timber, the leading one being 6 in. thick while the trailing one was 4½ in. thick. The buffers were 1 ft. 6 in. long, and the total length of engine over buffer-heads was 32 ft. 7½ in.

The side tanks were 15 ft. 6 in. long, 3 ft. 7½ in. high, outside, and were well rounded at the outer corners ; they held 1,200 gallons of water, and the full width over the sides was 8 ft. 4 in. The bunker was 8 ft. 7½ in. from side to side, 3 ft. 7½ in. high, 2 ft. from front to back and held 1 ton 7 cwt. of coal. Its inner corners were rounded to match those of the side tanks.

Engines 25 to 30 were originally provided with cabs, but the men protested so vehemently against what they described as rank suffocation, that the cabs had to be removed. At a later date, all the engines were provided with front and back weatherboards ; the front one, which had windows, was originally a plain straight-up shield, but subsequently it was turned over at the top for about 1 ft. 4 in. The back weatherboard was a plain vertical plate, 1 ft. 3 in. high, mounted on the back of the bunker ; it had no windows, and its top corners were well rounded.

Engines 1 to 36, in their original state had polished brass domes, bell mouthed and with two spring-balanced safety-valves on top, and the chimneys were of the usual very shapely Beyer, Peacock pattern with polished copper cap. The later engines had plain polished domes and cast-iron chimneys very similar to the so-called " built-up " kind on the Great Northern Railway.

The *original* livery was a bright green with black striping and red lining. From about 1886, however, all the engines were modified to the appearance seen in my drawings and photographs. A plain new chimney, almost exactly like one of Patrick Stirling's G.N.R. type was adopted, and the colour scheme was drastically altered, thus : boiler, side tanks, bunker and wheels became a very dark olive green without lining, though the tanks and bunker were edged with a narrow black border. The joint between the smokebox and the boiler cleading had a bright brass fillet. The boiler bands, cylinder clothing, smokebox, chimney, framing and all condenser pipes were black, but the edges




*The last two survivors of the District Railway's steam locomotives, in* 1923



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*No.* 34 *was actually the last one*

of pipe flanges were bright brass. The wheels had black axle-ends and tyres, but the latter were relieved by a bright orange line all round the inner edge. The front and back buffer-beams were vermilion on their outer faces, but black on top and at the ends. Slide-bars, connecting-rods, coupling-rods and cylinder end covers were bright steel ; an additional small point worth noting is that the coupling-rods were *outside* the connecting-rods.

After 1905, all but two of these fine old engines were withdrawn and scrapped ; the two survivors, 33 and 34, lasted till 1925, when 33 was scrapped, leaving 34 as sole representative of her class till 1928 when she, too, was broken up.